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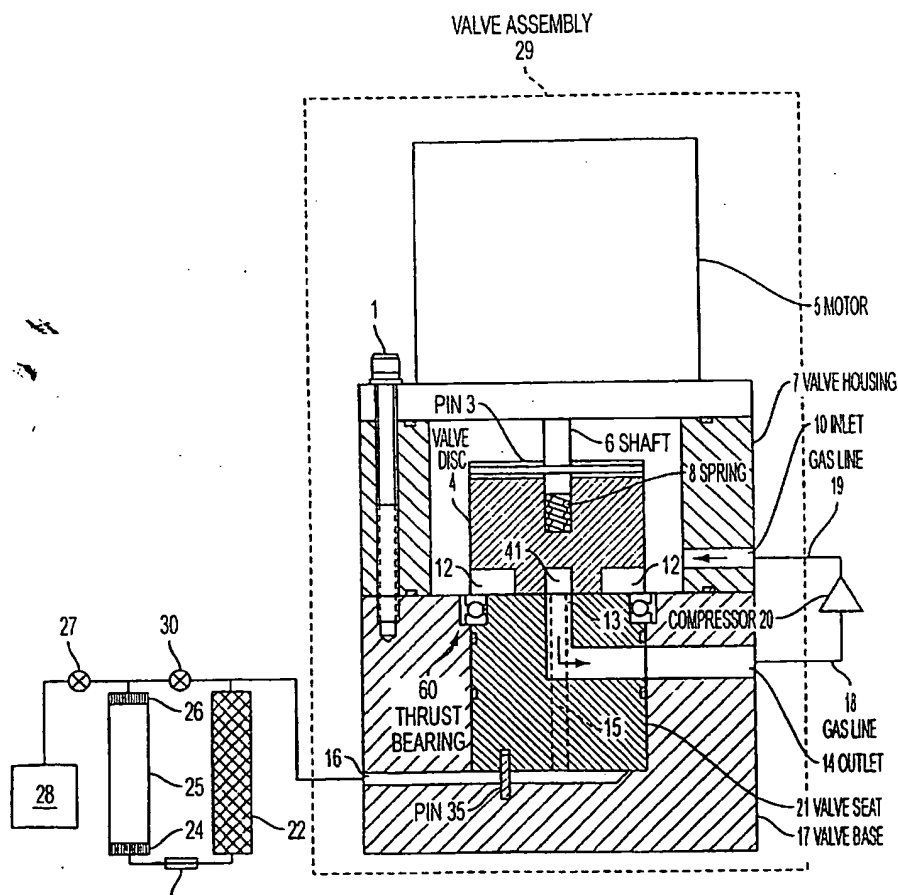
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| <p>(51) International Patent Classification<sup>7</sup>: <b>F25B 9/00</b></p> <p>(21) International Application Number:<br/>PCT/US2005/007981</p> <p>(22) International Filing Date: 8 March 2005 (08.03.2005)</p> <p>(25) Filing Language: English</p> <p>(26) Publication Language: English</p> <p>(30) Priority Data:<br/>60/551,154 8 March 2004 (08.03.2004) US</p> <p>(71) Applicants (for all designated States except US): <b>SUM-ITO HEAVY INDUSTRIES, LTD.</b> [JP/JP]; Intellectual Property Department, 9-11, Kitashinagawa 5-chome, Shinagawa-ku, Tokyo 141-8686 (JP). <b>SHI-APD CRYOGENICS, INC.</b> [US/US]; 1833 Vultee Street, Allentown, PA 18103-4783 (US).</p> | <p>(72) Inventors; and</p> <p>(75) Inventors/Applicants (for US only): <b>SEITZ, Eric</b> [US/US]; 5787 Fresh Meadow Drive, Macungie, PA 18062 (US). <b>GAO, Jin-Lin</b> [CN/US]; c/o Shi-APd Cryogenics, INC., 1833 Vultee Street, Allentown, PA 18103-4783 (US). <b>LONGSWORTH, Ralph, C.</b> [US/US]; 1833 Vultee Street, Allentown, PA 18103 (US). <b>XU, Mingyao</b> [CN/US]; 130 Cold Stream Court, Emmaus, PA 18049 (US).</p> <p>(74) Agents: <b>HELFGOTT, Samson et al.</b>; Katten, Muchin, Zavis, Rosenman, 575 Madison Avenue, New York, NY 10022-2585 (US).</p> <p>(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,</p> |
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(54) Title: WEARLESS VALVE FOR CRYOREFRIGERATOR



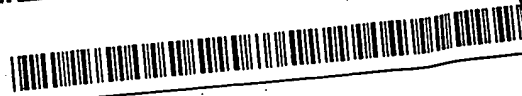
(57) Abstract: An improved method of reducing wear dust and torque required to turn a multi-port rotary disc valve utilizes a thrust bearing to hold the valve seat and/or valve disc such that they are not in contact with each other, or have light contact each other.



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